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Scale in environmental governance: Moving from concepts and cases to consolidation

Jens Newig and Timothy Moss

Research needs

Problems of scale are intrinsic to environmental governance. Managing natural resources across both political jurisdictions and biophysical scales is a familiar theme in the literature on human-environment relations (Meadowcroft 2002; Cash et al. 2006; Folke et al. 2007; Kok and Veldkamp 2011). Exploring the potential – and limitations – of up- or downscaling successful cases of environmental governance has also attracted much attention from scholars of institutional arrangements at local and global scales (Ostrom 1999; Young 2002; Gupta 2008). Other scalar problems frequently addressed include the plurality of scale frames (Cash et al. 2006) – i.e. how scalar issues are interpreted differently by different actors – and the trade-offs between higher-level effectiveness and lower-level accountability involved in choosing the ‘right’ scale of governance (Young 2002).

These scalar puzzles are primarily the realm of research on Social-Ecological Systems (SES) and Institutional Dimensions of Global Environmental Change (IDGEC). These two literatures have successfully elevated spatial scale to a central concern of research on environmental governance. They have, however, come in for some criticism from scholars with a more theoretically grounded understanding of scale: primarily human geographers working on the politics of scale (Brenner 2004; Swyngedouw 2004; Bulkeley 2005; Reed and Bruyneeel 2010) and political scientists working on multi-level governance (Hooghe and Marks 2003; Benson and Jordan 2010; Newig and Koontz 2014). The criticisms levelled at the SES/IDGEC communities are that 1) they have a largely essentialist understanding of scale, disregarding how it gets socially constructed, 2) they take a managerialist approach to governance, seeking optimal scalar fixes, 3) they treat scale as an apolitical category, downplaying the power struggles and contestation involved in making scales work, and 4) they tend to view scales as static, rather than being perpetually reconfigured and refined. As researchers of the politics of scale and multi-level governance

increasingly turn their attention to the scalar dimensions and dynamics of human-environment relations they are inserting fresh vitality and variety to a debate that had appeared well circumscribed.

It is against this backdrop of an expanding research agenda that we present this special issue on scale in environmental governance. The purpose is to reflect this diversity of approaches to scale in the study of human-environment relations with recent empirical research interpreted from the perspective of distinctive conceptual frameworks. In our earlier work (Moss and Newig 2010, pp.2-3) we identified from the literature a number of generic problems of scale relating to the environment in general, and water resources management in particular:

- Problems of misfit between different scalar dimensions,
- Problems of identifying the ‘optimal’ scalar level,
- Problems of vertical interplay between different levels of action,
- Problems of rescaling, or scalar reconfiguration, and
- Problems of upscaling and downscaling governance models.

Solutions to these scalar challenges were analysed there in terms of three criteria: democratic legitimacy, (cost-)efficiency and equity (Moss and Newig 2010, pp.3-4). Here, in this special issue, we follow up on this earlier work with a collection of papers which is deliberately broader in scope, both empirically and conceptually. The contributions to this special issue comprise responses not only to the enriched theoretical debate on scale, but also to major environmental governance projects with strong scalar implications that have emerged since 2000. To name just a few: European Union environmental regulations have ‘rescaled’ governance to local and/or biophysical scales (water and air quality directives); global scientific assessments such as the Millenium Ecosystem Assessment or the Intergovernmental Platform on Biodiversity and Ecosystem Services have reconfigured the scalar politics of their respective fields. Such developments, but also smaller-scale governance initiatives, warrant the application and continued testing of the major scale discourses which emerged around the turn of the millennium. In the remainder of this introductory paper we, firstly, explain the purpose and character of the special issue, secondly, summarize the content of the selected six papers, grouped into three overarching themes, and, thirdly, draw from these papers a number of cross-cutting issues and conclusions on ways forward for future research on scale in environmental governance.

The special issue

This special issue is unique in that it brings together scholars with diverse epistemological and disciplinary backgrounds working on issues of scale and multi-level governance pertinent to environmental governance. It is deliberately broad in scope, seeking to explore complementarity and dissonance between different – and hitherto largely unconnected – strands of research. Conceptually, the papers have been inspired by three schools of thought, namely critical human geography (‘politics of scale’; see Brenner 2004; Bulkeley 2005), social-ecological systems and resilience (‘scalar fit and interplay’; see Folke et al. 2007; Cash et al. 2006) and political science (‘multi-level governance’; see Andonova and Mitchell 2008; Newig and Koontz 2014). Empirically, the human-environment relations investigated in the papers range from renewable energy, ecosystem service provision, air pollution and agriculture to global environmental issues such as climate change and biodiversity. The case studies presented come from across the globe, including The Netherlands, Germany, Brazil, Poland and the United Kingdom.

Together, the papers here map out the breadth of perspectives from which scalar issues in environmental governance can be addressed and illustrate their application with a rich variety of human-environment relations. The overall purpose of the special issue is four-fold. Firstly, it presents and discusses state-of-the-art theoretical and empirical research on scale and environmental governance from diverse perspectives and disciplinary fields. Secondly, it illustrates the relative strengths and weaknesses of the various

conceptual perspectives applied, indicating promising avenues of future research in collaboration. Thirdly, it highlights diverse methods of applying concepts of scale in empirical research on environmental governance. Fourthly, it discusses the implications of scale and scalar politics for improved, effective and legitimate forms of environmental governance.

The contributions for this special issue were selected from full papers presented at the symposium ‘Scale in Environmental Governance: Power Reconfiguration, Democratic Legitimacy and Institutional (Mis-) Fit’, which was held on 7-8 March 2013 at the Berlin-Brandenburg Academy of Sciences and Humanities in Berlin. The symposium was organised by Leuphana University Lüneburg, Germany, and the Leibniz Institute for Regional Development and Structural Planning (IRS) in Erkner, Germany. The symposium was a core product of the collaborative research project ‘Water Governance and Problems of Scale - the Example of Institutionalizing River Basin Management through the EU Water Framework Directive’ (WaterScale; www.WaterScale.info), which were funded by the German Research Foundation (DFG) between 2011 and 2013.

The papers

The collection of papers mirrors the development of the field of scale in environmental governance. While drawing on empirical case studies, all papers essentially aim at testing or further developing conceptual lenses, e.g. through providing a framework for the analysis of scale issues in ecosystems services governance (Albert 2017); by combining critical state theory and Science and Technology Studies (STS) to study scale in scientific assessments (Beck et al. 2017) or by introducing different notions of power in the analysis of scale framing (Lieshout et al. 2017).

Three contributions examine the scalar re-organization of environmental governance involving sub-national governments’ interaction with national and supra-national levels of decision-making.

Richard Cowell, Geraint Ellis, Fionnguala Sherry-Brennan, Peter Strachan and David Toke (2017) approach the rescaling of renewable energy governance in the UK from the perspective of devolution. Four fundamental scale-related insights emerge from their empirical study, which has been particularly informed by works of Bop Jessop and Harriet Bulkeley. *First*, what environmental governance scholars could identify as a ‘rescaling of environmental governance’ might in fact be just an implication of a larger, more general rescaling effort such as an administrative reform (here: the process of devolving competencies to the sub-national governments of Scotland, Northern Ireland and Wales) in which environmental ‘fit’ plays no significant role. *Second*, the authors alert us to keep apart the different modes of governance that are rescaled (or not), such as strategy development, planning or financing. This may lead to a paradoxical situation in which new strategies might reflect a newly empowered sub-national level, whilst the ability to deliver remains dependent on national government subsidies. *Third*, we are reminded of the challenges in determining the ‘right’ governance level in the sense of finding ‘spatial fit’. This is complex in the energy sector because siting decisions for wind energy (the dominant renewable electricity source studied) are mostly local, affecting local concerns, but raise important issues about electricity grids and therefore large-scale infrastructure decisions which are of concern for the UK as a whole. *Fourth*, the paper raises the question of the relevance of rescaling, given continuities of actor constellations, collaboration, built infrastructure and other established institutions that create path-dependency. Taken together, Cowell et al. describe and highlight the importance of the governance *context* in which rescaling occurs.

Joana Setzer (2017) studies the role of sub-national government in actively rescaling environmental governance. If Cowell et al. explore what happens to sub-national governments when re-scaling occurs, Setzer examines how sub-national governments (SGs) actively instigate and shape rescaling to the effect that their own position in environmental governance is strengthened – both nationally and internationally. Informed by the International Relations and global environmental politics literature, Setzer develops a typology of six forms of rescaling from the perspective of sub-national government, inferred from

the case of the Brazilian state of São Paulo. Distinguishing ‘vertical’ and ‘horizontal’ dimensions of subnational rescaling on subnational, national and international levels of decision-making, respectively, she identifies horizontal subnational rescaling (networks among states to exchange and collaborate on mutual interests); horizontal rescaling at the national and international level (SGs acting together to influence national or international policy, e.g. to go beyond national policy standards); as well as vertical upward rescaling at the subnational level (involving cooperation between SGs and international organizations), at the national level (SGs engaging in the agenda setting of multilateral environmental agreements) and the international level (SGs actively participating in the negotiation of multilateral environmental agreements).

Lenschow et al. (2017) address scalar issues of subnational decision-making in a context of European Union policy implementation, studying the implementation of the 2008 Air Quality Directive in 12 European cities in Germany, the Netherlands and Poland. Mandating the production of air quality and action plans to reduce air pollution at the level of “zones and agglomerations” as “the most appropriate” spatial level, the Directive attempts a functional rescaling of governance to match biophysical scales. Taking a political science perspective, the authors assess the effectiveness of such rescaling, i.e. the question of whether rescaling to local but at the same time ‘appropriate’ spatial governance units is conducive to tackling mounting air pollution issues. They come to suggest “that national implementation structures are poorly adapted to the spatial notions implied in the EU ambient air quality policy, but also that the EU policy places (functionally speaking) unproportional burden on the local level”. Thorough empirical analysis reveals that the aspired ‘spatial fit’ of institutional and biophysical scales has been achieved to a limited degree only: while planning considers areas defined by levels of high air pollution, it does not take into account the spatial implications of problem *causes* (e.g. commuter flows across municipal boundaries). Moreover, local administrative competencies and resources in most cases do not match the increased degree of local responsibility, even more so as the authors find little political mobilization for ambitious local air quality policy. In sum, seemingly major rescaling activities – mandated by the European Union and affecting local agglomerations throughout Europe – appear highly problematic in terms of both effectiveness and legitimacy, thus challenging conventional wisdom about scalar fit hypotheses.

Two contributions highlight, in particular, the social construction of scales and the political nature of scale construction.

Silke Beck, Alejandro Esguerra and Christoph Goerg (2017) draw on critical geography (politics of scale literature) and critical state theory to study the redistribution of power and responsibility in debates on scales and levels in global scientific assessments. Different from the other contributions in this special issue, this article, hence, examines scalar issues in the field of science – albeit with links to governmental politics. Drawing on the cases of the Millennium Ecosystem Assessment (MA) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), the paper studies scalar issues in the making of expert organizations. Generally, both assessments pay attention to the choice of scalar levels, granting greater value to local levels in particular in order to include local and indigenous knowledge. However, how exactly such knowledge is to be aggregated and at which spatial scale sub-levels of assessment should be institutionalized have been subject to constant debate. For example, the notion of ‘region’ has been contested as to whether it refers to United Nations regions or to biophysical regions. The result of such decisions has, of course, not only scientific implications but also affects empowerment and policy-making in the concerned states.

Maartje Van Lieshout, Art Dewulf, Noelle Aarts and Catrien Termeer (2017) connect the politics of scale approach with the literature on the framing of environmental issues. Both strands of the literature point to the construction of ‘scale’ during the course of social processes. The empirical basis forms a deliberative governance process on intensive agriculture in The Netherlands, comprised of a series of subsequent episodes. Here, political-administrative decision-making blends, or alternates, with collaborative governance, involving stakeholders from different sectors of society. The authors consider the

nature of scalar references (farm-level, regional, national, EU, global), focusing on the question of power: whose scale frames influence decision-making? We learn that while stakeholders' different scale frames appear to be influential in the course of the governance process, it is the state's perspective that ultimately dominates, not the least because the informal governance episodes appear less transparent and more conducive to power-play than the more formal governmental decision-making episodes with clear standards of accountability. Hence, scalar issues are considered here in the broader arena of power play in complex environmental governance processes.

Turning to more operational issues, our sixth contribution places particular emphasis on how scale-related spatial spillovers can be detected and which policy options emerge from a model-based analysis.

Christian Albert, Christina von Haaren, Frank Othengrafen, Sebastian Krätzig and Wiebke Saathoff (2017) study scalar implications of ecosystem services governance. Drawing on an in-depth case study of bioenergy production in the region of Hanover, Germany, they develop a framework for analysing trade-offs between different ecosystem services that is designed to be practically applicable in decision-making. Using the "DPSIR" model of human-environment interactions (drivers, pressures, states, impacts, responses), the authors consider different scale-effects with regards to ecosystem services provision. These effects comprise positive and negative spillovers from one administrative level to others ('value-related' and 'process-related' scale effects) as well as space crowding (cumulative effects). To this end, the authors consider habitat types, biogas plants and other land uses to integrate them in a spatially explicit GIS model designed to help decide whether spillovers would suggest an upscaling or downscaling of competences to different jurisdictional levels.

Cross-cutting issues and future research directions

Looking across the papers presented in this special issue we can extract five key scalar issues of environmental governance which indicate promising avenues for future research. These relate to the social construction of scales, practices of scalar action, scalar dilemmas, scalar politics and the relationship of scale to other spatial dimensions, as follows:

1. **Producing scales:** Constructivist approaches teach us that scales are not a phenomenon 'out there' waiting to be analysed, but a product of social and political construction (Beck et al. 2017). The scales in which environmental resources are perceived, used and regulated are not pre-given but created out of processes of social interaction, and environmental rescaling may be used strategically (cf. Gruby and Basurto 2014). Policy initiatives to address biodiversity, for instance, have only recently been taken at a global level (Beck et al. 2017). Institutionalizing the river basin as the unit for water resources management is a further example of rescaling environmental governance. As Lieshout et al. (2017) demonstrate, scales of environmental governance can get framed in very different ways by different actors. This social construction of scales leads to some aspects being included in the scalar frame, whilst others are excluded. Contestation between older, predominant and new, competing scalar constructions is a theme running through several of the papers. Their findings illustrate that acknowledging diverse scalar framings can enrich environmental policy-making.
2. **Scalar practices:** The production of scales does not emerge through discourse alone but through the actions and interactions of those involved in using or protecting environmental resources (Neumann 2009, p.399). When a product becomes traded on global markets, for instance, its regulation requires scaling up to the international level. What the papers reveal are interesting illustrations of how actors try to generate new scales of action or strengthen existing ones and how they respond to shifts in the scalar governance of an environmental resource (Setzer 2017; Lenschow et al. 2017; Cowell et al. 2017). One prominent example is the practice of what may be called 'scale-jumping', whereby certain actors, such as subnational governments, work simultaneously on several scales (Setzer 2017). Identifying distinctive types of scalar practice is a fruitful way forward in this field (cf. Hüesker and Moss 2015).

3. ***Scalar dilemmas***: Finding suitable scales for environmental governance is a task fraught with dilemmas. Managing a resource at the local or regional level might enable greater involvement of user communities, but is prone to overlook spatial externalities and the uneven distribution of risks (Cowell et al. 2017; Albert et al. 2017). Organizing resource use around the scalar dimensions of biophysical flows – such as the river basin for water management – might improve the institutional ‘fit’ for the resource in question, but raises issues of legitimacy if democratically elected bodies are sidelined in the process (cf. Moss 2012). A further dilemma surrounds the optimal scale for effective governance. Here, trade-offs are commonplace between better coordination at a higher scale and better implementation at a lower scale (Albert et al. 2017; Cowell et al. 2017; see also Newig et al. 2016).
4. ***Scalar politics***: Scales are not politically benign – nor are they necessarily malicious. The construction and production of scales is generally a deeply political process involving a redistribution of influence (Lieshout et al. 2017). Processes of rescaling environmental governance invariably lead to shifts in power relations regarding resource use and regulation. This can be beneficial for some actors, opening up new opportunities to advance their interests, but detrimental for others, which might be excluded from influence or become victims of scalar by-pass. This does not prevent initiatives for scalar reconfiguration being presented as based on rational calculus and beyond politics (Beck et al. 2017). Such instances can usefully be interpreted as attempts to de-politicize new (or old) scales of governance. Protests against this are examples of scalar re-politicization.
5. ***Scale and other geographies***: Any focus on issues of scale runs the risk of overstating the importance of scale and downplaying or overlooking the relevance of other spatial dimensions. By way of a caveat, therefore, it is important to acknowledge the significance for environmental governance of territory and processes of re-territorialisation (Cowell et al. 2017), of place (Albert et al. 2017) and of functional spaces built around stakeholder networks (cf. Jessop et al. 2008). How scalar issues become entangled in territorial politics, place-based identities or regional policy networks is a promising field for further work, as several of the papers imply.

Finally, the papers encourage future scholars of environmental governance to use their analytical insights to develop normative visions for effective, equitable and beneficial scalar politics. New scalar imaginaries are needed to provide orientation for alternative structures and processes of governance across scales.

Looking beyond the collection of papers in this special issue we can point to additional avenues for future research on scale in environmental governance. Firstly, there is a need to consolidate the field, going beyond the kinds of case-study analyses presented here to develop hypotheses which can be applied and tested in either large-n quantitative analyses, or in medium-n studies using structured methods of integration such as Qualitative Comparative Analysis (QCA). To our knowledge such studies do not exist. This is indicative of an emergent field of scholarship that has yet to develop its own, specific coordinates. It distinguishes research on scale in environmental governance from other, related fields of study, such as International Relations or Environmental Policy that can draw on established theories and a tradition of theory-testing contributions. Secondly, new developments in neighbouring fields may enrich scalar studies. For example, the dynamic field of social-ecological network analysis has recently been linked to scale approaches, thus allowing for a more structured analysis of scale-relevant social and environmental relations (Sayles and Baggio 2017). Thirdly, globalization, and specific telecoupled links between particular regions on the globe (Lenschow et al. 2016; Friis et al. 2015) not only challenge environmental sustainability but also notions of scale. Finally, we see huge potential in communicating and discussing knowledge on the scalar dynamics of environmental governance with government agencies, environmental NGOs, businesses and social movements. Making stakeholders aware of, for instance, the scale-jumping strategies employed by some organizations in implementing the EU Water Framework Directive can encourage them to optimize their own approach (Hüesker and Moss 2015). Elucidating the practical applications of a scalar perspective on environmental politics and inserting

these into debates on the future of environmental governance poses a real challenge to the research community.

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